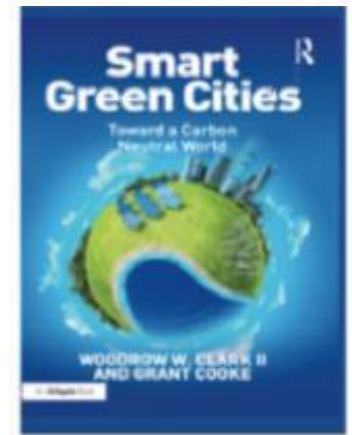
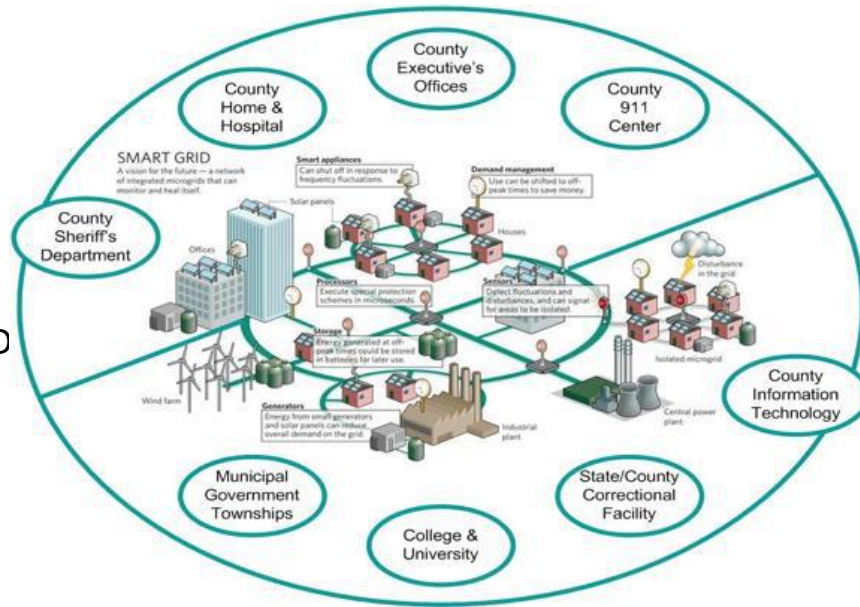




# Europe, USA and China: the future of the green circular economy for global stability

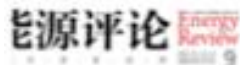
## The Global Green Development Economy (G<sup>2</sup>E)



Woodrow W. Clark II, MA3, PhD  
 Qualitative Economist  
 Clark Strategic Partners  
 California, USA

Woodrow W. Clark 博士  
 经济学家  
 学术专家  
 科技领域跨学科学者

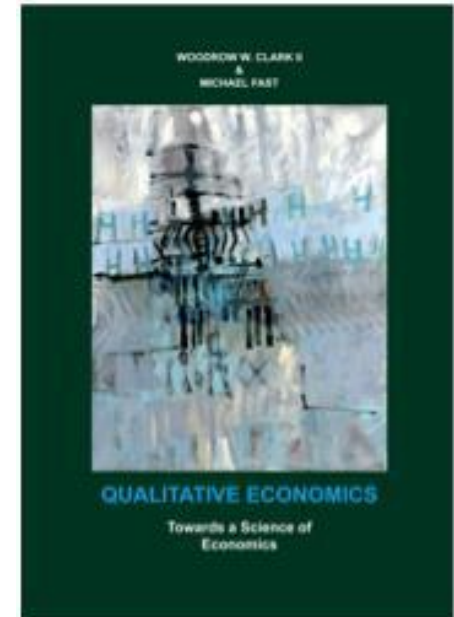
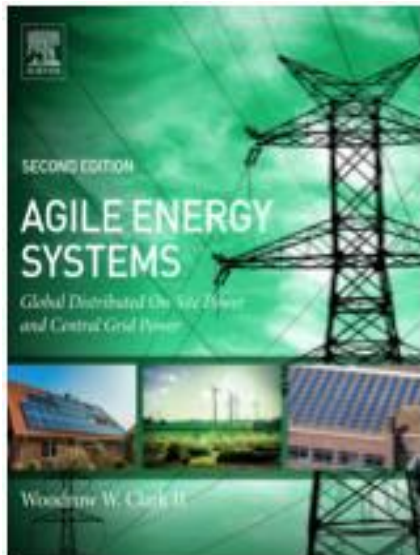
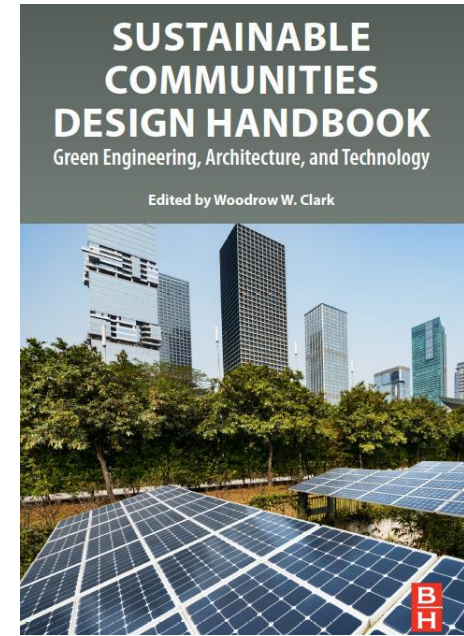
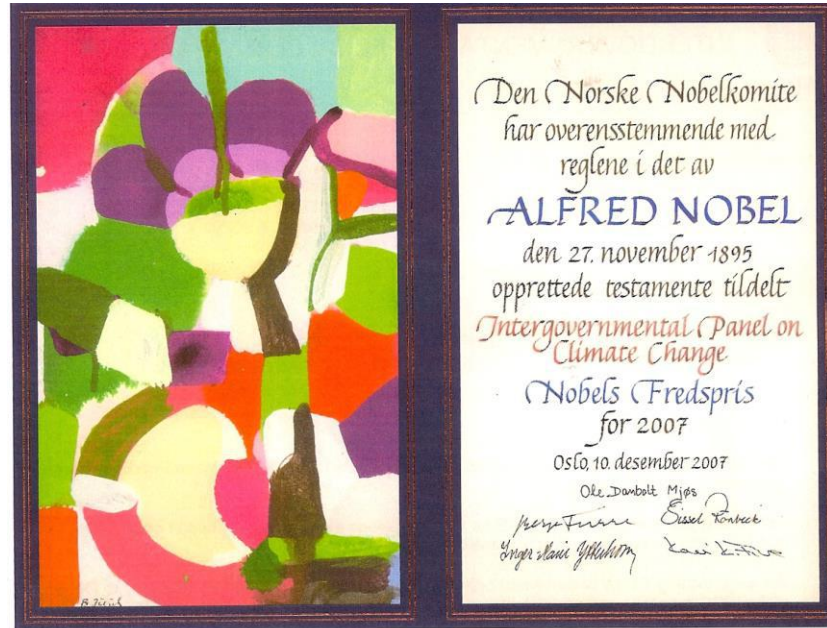
National Council of Green Energy  
 Minister of Environment  
 Ministry of Economic Development



Smart Green Cities: The End of the Oil Age by Woodrow W. Clark II



# Contemporary Economics has failed so The Next Economics is the Key for GIR



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



PRESENTED TO

**WOODROW W. CLARK JR.**

FOR CONTRIBUTING TO THE AWARD OF THE


**NOBEL PEACE PRIZE**

FOR 2007 TO THE IPCC

R. K. Pachauri  
IPCC Chairman

R. Christ  
IPCC Secretary





# CLIMATIC

An environmental television drama  
to save the planet

Created by:  
**Woodrow Clark II**  
&  
**Maleena Lawrence**



Kids Green Planet



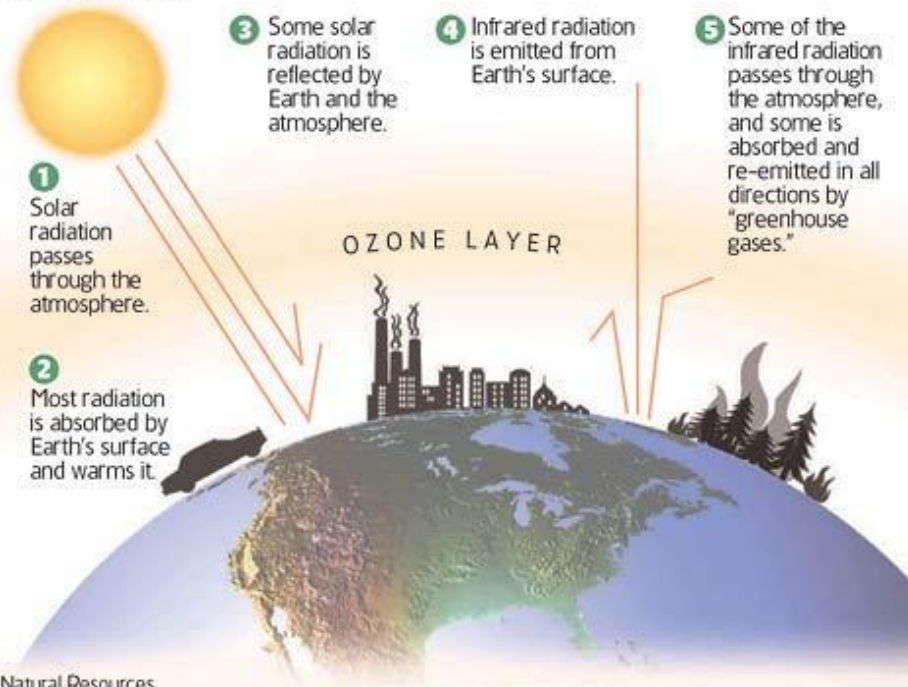
Beverly Hills Building Bullies  
(BHB<sup>2</sup>)

# An Economic Paradigm Change !!!

## The World is Round – Not FLAT – so is Economics

### The “greenhouse” effect

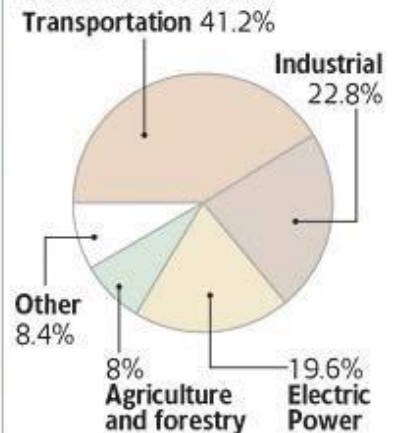
Carbon dioxide does not pose a direct threat to human health, but it absorbs Earth's reflective radiation from the sun, retaining heat like the glass panels of a greenhouse. This and other heat-trapping gases from vehicles, power plants and other sources of fossil fuel combustion help form a thermal blanket around the globe. This has the effect of artificially raising temperatures and changing climate.



Sources: California Energy Commission, Natural Resources Defense Council, U.S. Environmental Protection Agency

### California's emissions sources

Vehicle exhausts are the single largest source of California's climate-changing emissions, followed by releases from industrial and power plants, most fueled with natural gas.



Sacramento Bee/Olivia Nguyen and Nathaniel Levine



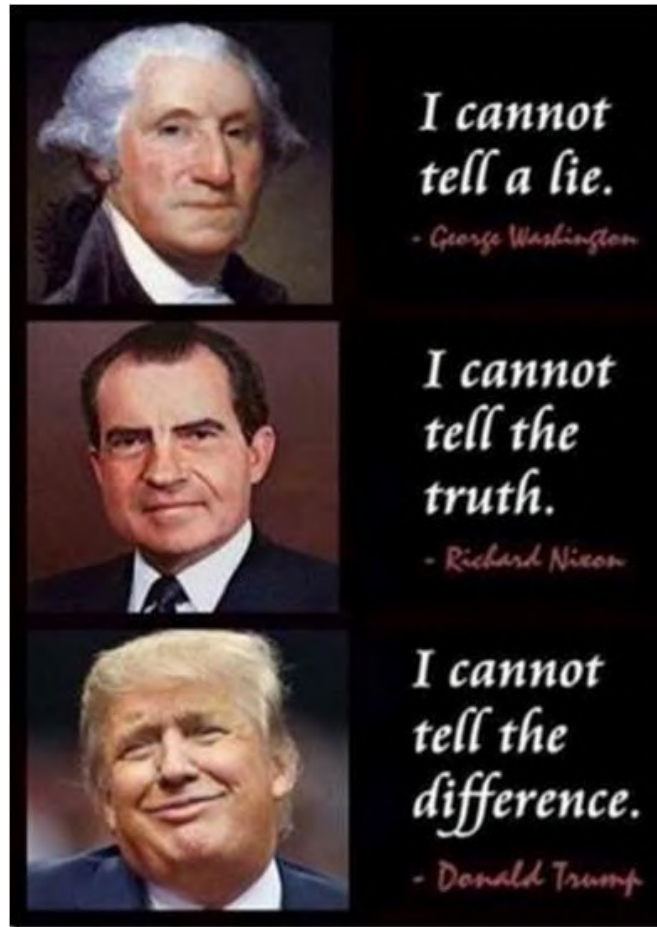
# USA Presidents

Political Corruption

Then Nixon

and

NOW Trump



## Sexual Harassment

...LA FAMOSO per avere fatto la fortuna del cinema negli Stati Uniti.  
Oggi il produttore HARVEY WEINSTEIN è al centro di un enorme  
scandalo sessuale. Accusato di molestie da numerose attrici (a Los Angeles  
e non solo), è stato licenziato dalla sua compagnia e cacciato dagli Oscar  
di PAOLA JACOBBI



And current issues in question:

Harvey Weinstein

# America: where is it going?

## Solutions from Media 4 decades ago

### Affordable Health Care

The Healing Force (RE: Laughter is the Best Medicine) featuring Norman Cousins

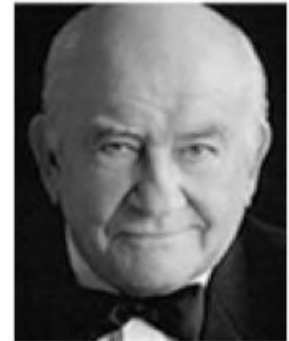
<https://vimeo.com/ondemand/thehealingforce>



### Sexual Harassment

Workplace Hustle (short doc and longer doc titled Sexual Shakedown), Both hosted by Ed Asner

<https://vimeo.com/ondemand/sexualshakedown>



**Clark Mass Media Company (CM<sup>2</sup>C)**

Woodrow W. Clark II, PhD

Chair and Executive Producer

Beverly Hills, CA 90209



# The Case of Disruptive Economics



## Patent Invention Disclosure: Applied dated: February 12, 2012 Economic Efficiency Through Lighting (Nularis Corporation)

**Title:** Method and design of software and related systems which couple amortized loan terms and payments with predicted and actual energy cost savings.

**Inventor(s):** Woodrow W. Clark II PhD, Wendell Brown, and Jonathan Fram

**Background of the Invention:**

Energy efficiency and conservation are important in order to achieve international goals for reduction of greenhouse gas emissions, fossil fuel usage, grid load strain, costs, and a wide range of other benefits. However, many approaches to energy efficiency and conservation involve significant capital outlays that create financial management risk, provide undetermined return-on-investment rates and payback periods, which often hinder their adoption.

These inventions relate particularly to methods and design of software and systems which run in computing environments (computer hardware, virtual CPU environments, servers, computers, tablets, wireless mobile devices, etc.) that couple and integrate amortized payment terms and amounts with predicted and actual energy cost savings. The inventions are thus novel, innovative, and useful in that they provide a mechanism for financial risk reduction/management and predictable cost outlays (loan repayment terms that are directly linked to energy savings), thus serving as an enabler for the financing of such energy efficiency and conservation projects.

**Description of the Inventions:**

The inventions relate to the methods and design of software and related systems which couple amortized payment amounts with predicted and actual energy cost savings.

**Features as Formulas: 1-14:**

14: The formula for the periodic payment amount  $A$  is derived as follows. For an amortization schedule, we can define a function  $p(t)$  that represents the principal amount remaining at time  $t$ . We can then derive a formula for this function given an unknown payment amount  $A$  and  $r = 1 + i$ .

$$\begin{aligned}
 p(0) &= P \\
 p(1) &= p(0)r - A = Pr - A \\
 p(2) &= p(1)r - A = Pr^2 - Ar - A \\
 p(3) &= p(2)r - A = Pr^3 - Ar^2 - Ar - A
 \end{aligned}$$

$$p(t) = Pr^t - A \sum_{k=0}^{t-1} r^k$$

Applying the substitution:

$$\sum_{k=0}^{t-1} r^k = 1 + r + r^2 + \dots + r^{t-1} = \frac{r^t - 1}{r - 1}$$

After substitution and simplification we get

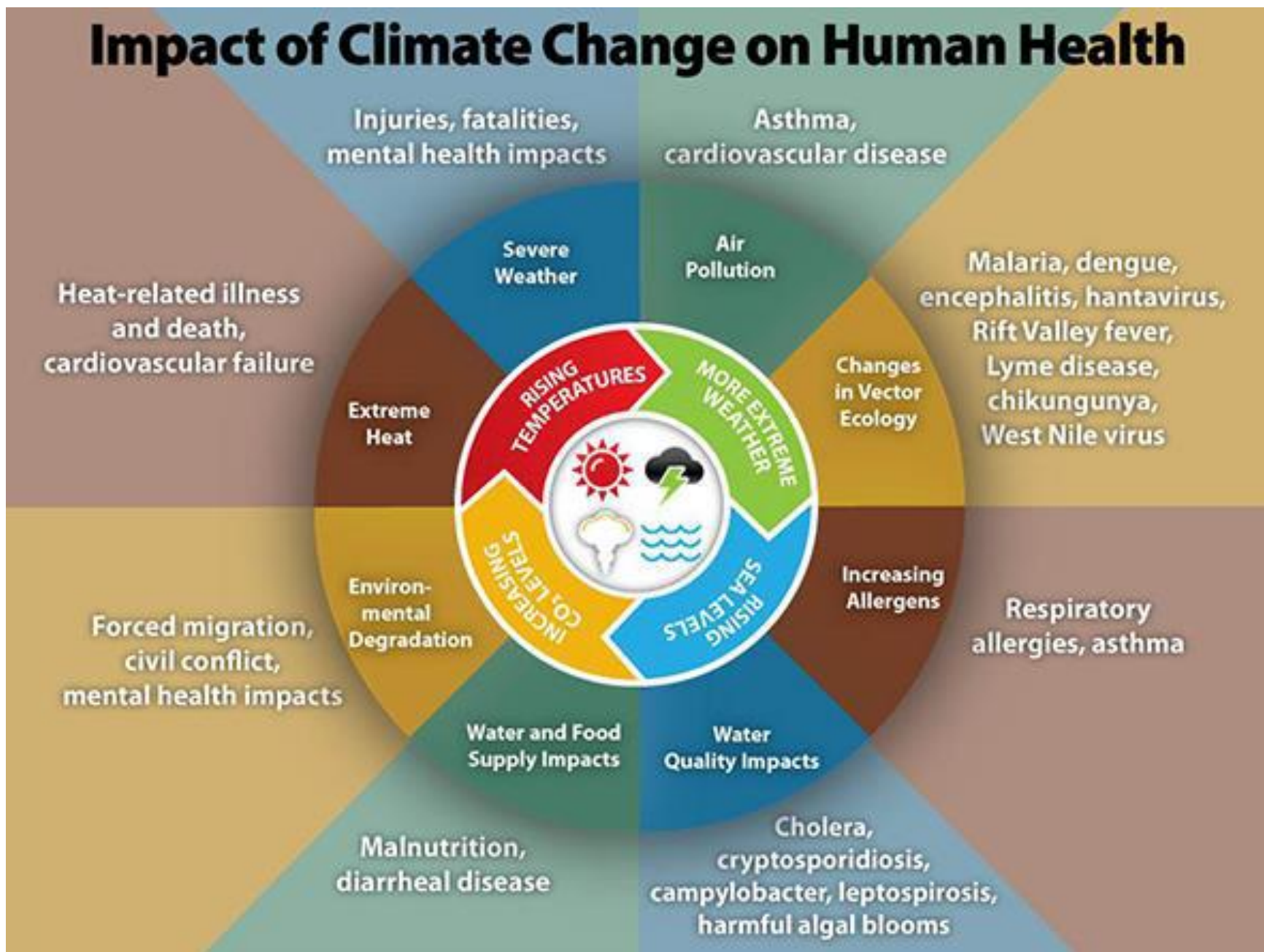
$$\frac{p(t)}{P} = 1 - \frac{(1+i)^t - 1}{(1+i)^n - 1}$$

The annuity formula is:

$$A = P \frac{i(1+i)^n}{(1+i)^n - 1} = \frac{P \times i}{1 - (1+i)^{-n}} = P \left( i + \frac{i}{(1+i)^n - 1} \right)$$



# Impact of Climate Change on Human Health

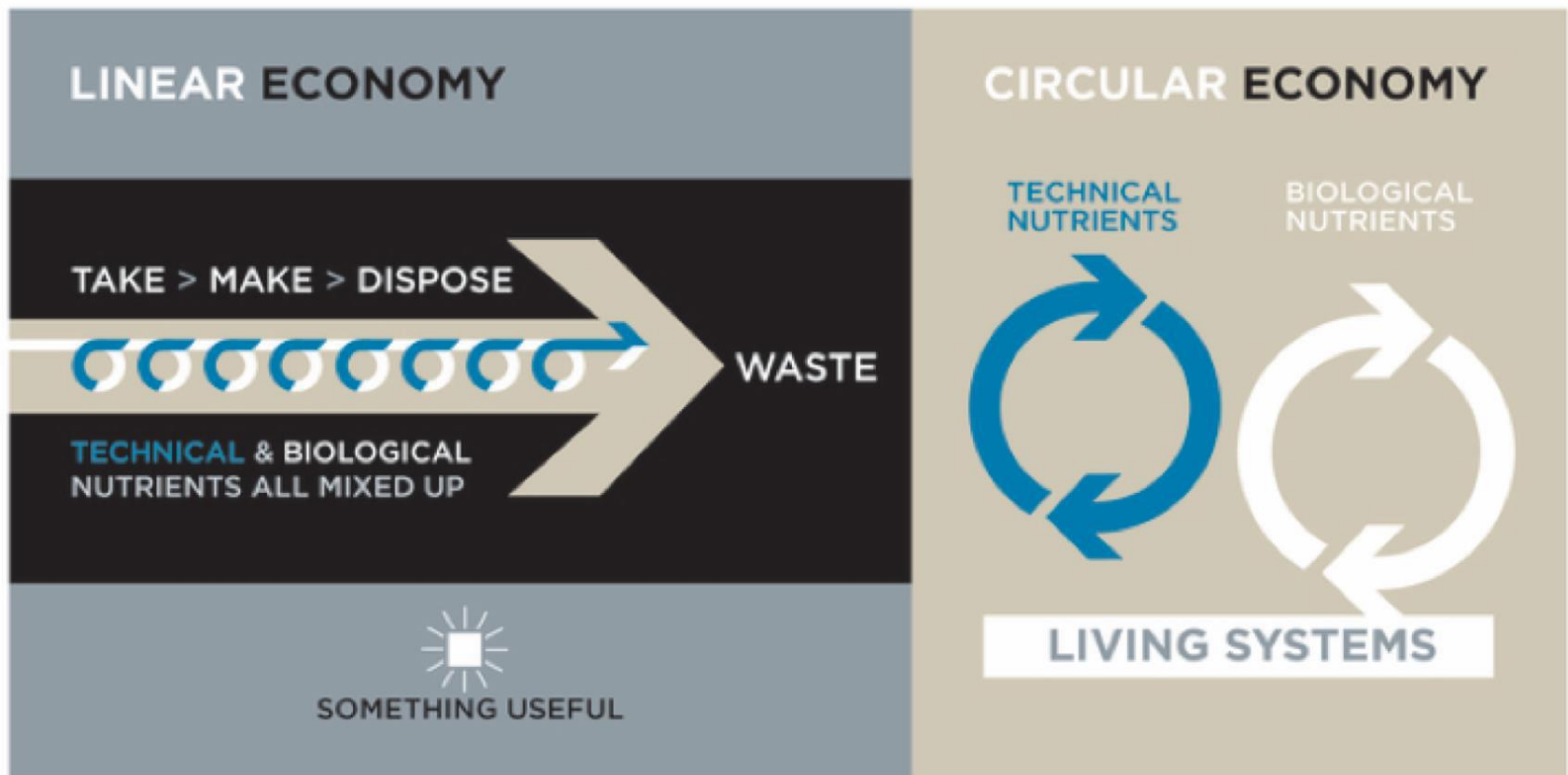




# QE as Applied in Circular Economics

Neo-Classical (Conventional) Economics

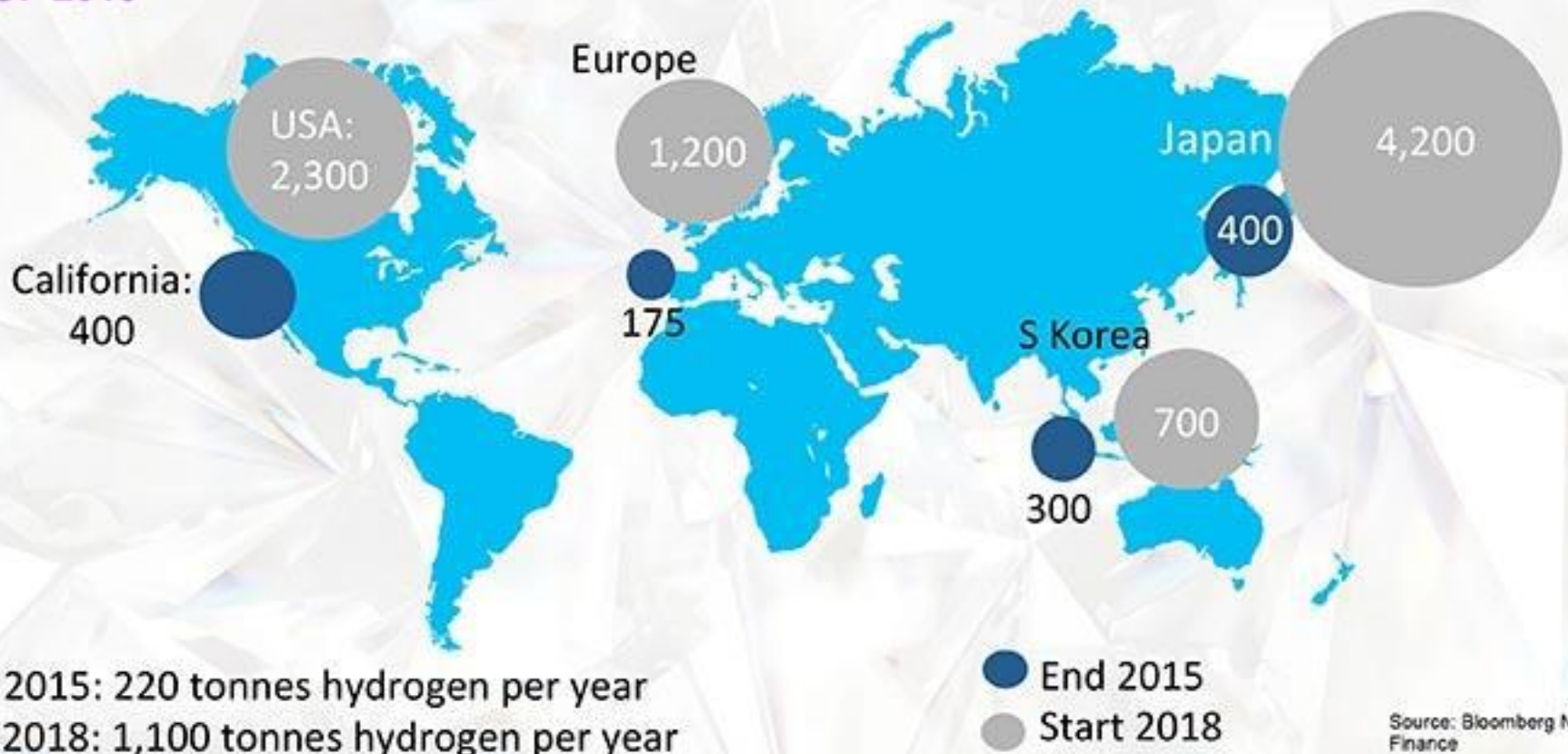
Circular Green Economics (QE)



# Circular Economy and Transportation Mobility:

Fuel-Cell Cars Are Moving Out of the Lab and Onto the Streets

NUMBER OF FUEL CELL ELECTRIC VEHICLES ON ROADS, END OF 2015 & START OF 2018





# The Convenient Truth: the sequel series

Global cases of communitites

“THE ULTIMATE  
POWER STILL  
LIES WITH THE  
PEOPLE!”

—  
AL GORE



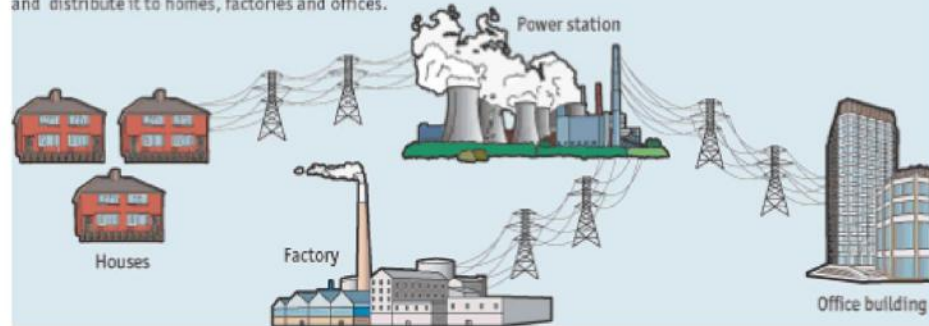
RSVP NOW!

# Agile Energy Systems become Global Communities

## The shape of grids to come?

### Conventional electrical grid

Centralised power stations generate electricity and distribute it to homes, factories and offices.

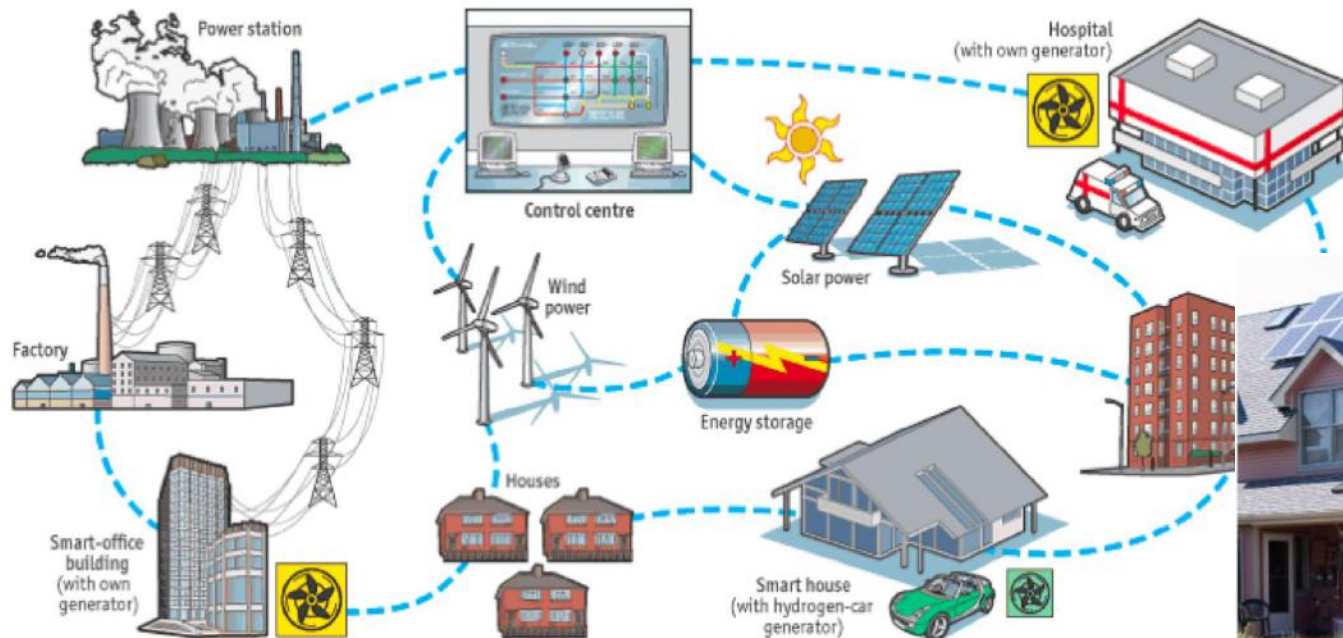


### Energy internet

Many small generating facilities, including those based on alternative energy sources such as wind and solar power, are orchestrated using real-time monitoring and control systems.

Offices or hospitals generate their own power and sell the excess back to the grid. Hydrogen-powered cars can act as generators when not in use. Energy-storage technologies smooth out fluctuations in supply from wind and solar power.

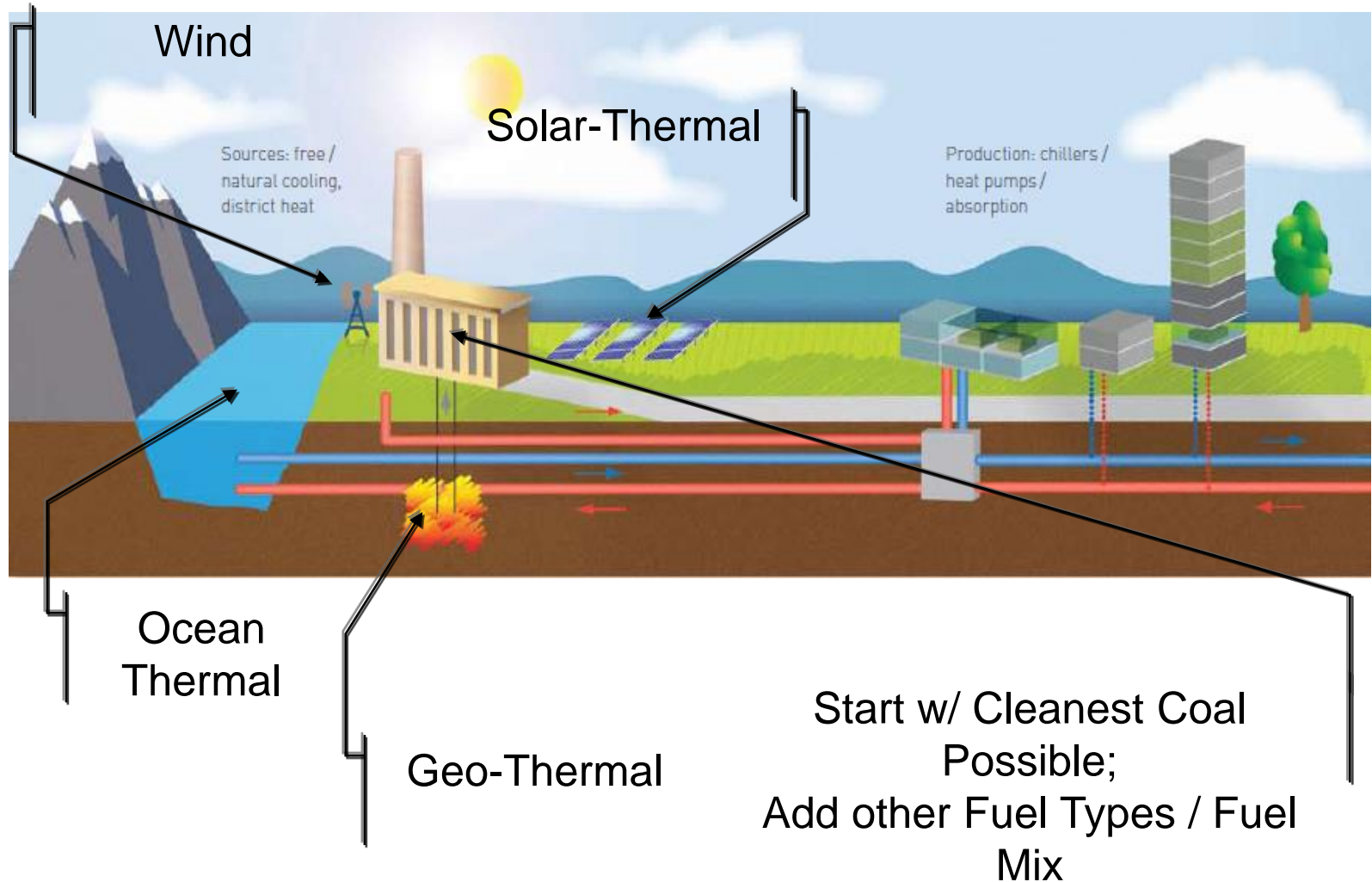
Distributing power generation in this way reduces transmission losses, operating costs and the environmental impact of overhead power lines.





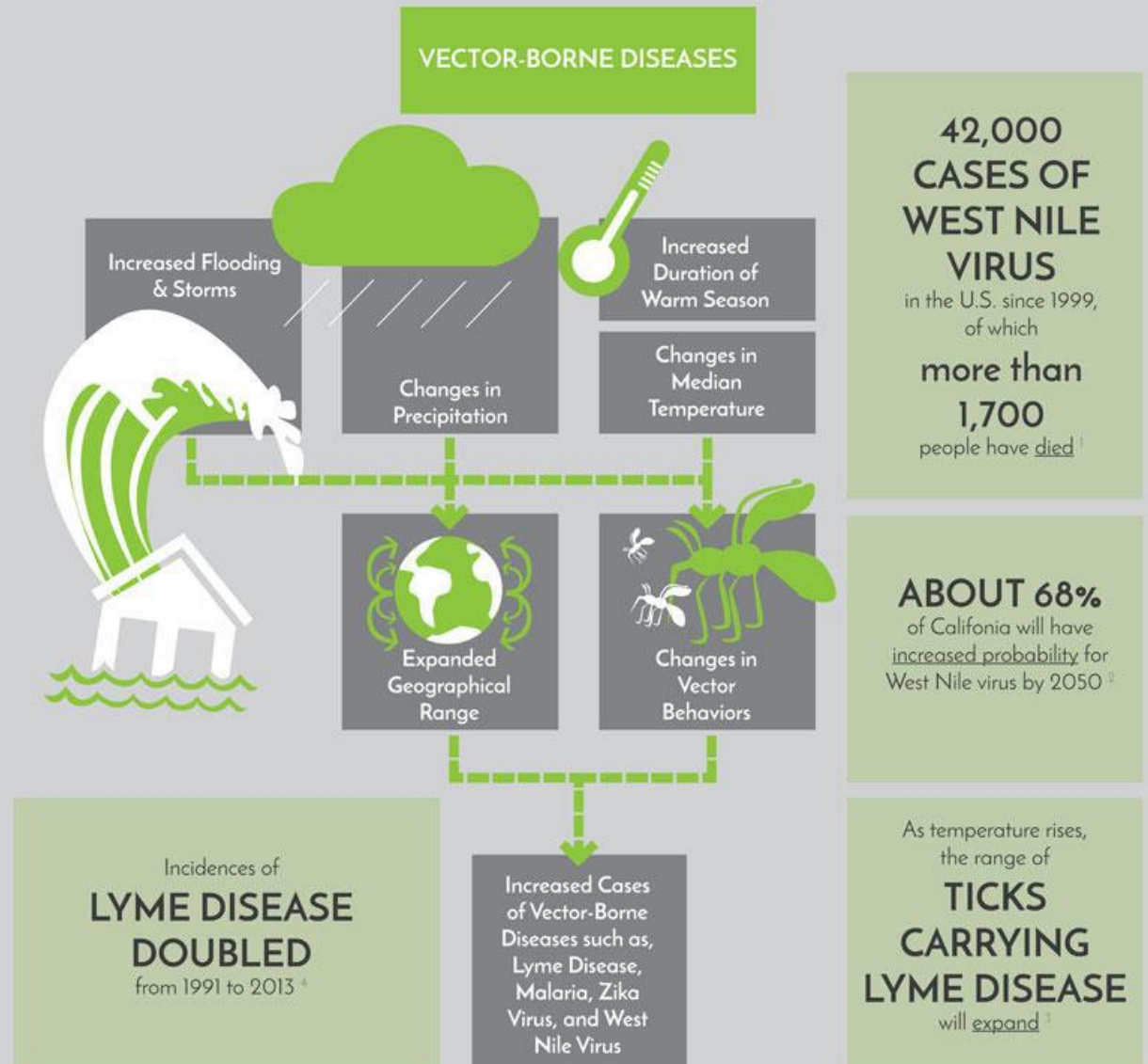
# As Cost Go Down, Technology Matures and Demand Increases with Government support, policy and financing

The new “disruptive” technology(s) are part of the Green Industrial Revolution: Energy conservation - the Case of LED Bulbs



American  
Public Health  
Association (APHA):  
For science, action  
and health (July 2017)

## HOW CLIMATE CHANGE AFFECTS YOUR HEALTH



1. <http://www.cdc.gov/features/lyme/index/>  
2. <http://www.fda.gov/oc/ohrt/2012/01/12/120114.pdf>  
3. <http://www3.epa.gov/climatechange/impacts/health.html>  
4. [http://www3.epa.gov/climatechange/indicators/health\\_society/lyme.html](http://www3.epa.gov/climatechange/indicators/health_society/lyme.html)



# New Economy Roundup

August 3, 2017

Democracy, lessons from Germany's Energiewind, and the Pennsylvania town that put a right to clean air and water on the books! Plus: Check out the latest articles from our New Economy Reporting Project Fellows!



# Ellen MacArthur Foundation

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows  
 ReSOLVE levers: regenerate, virtualise, exchange

Renewables    Finite materials

Regenerate Substitute materials Virtualise Restore

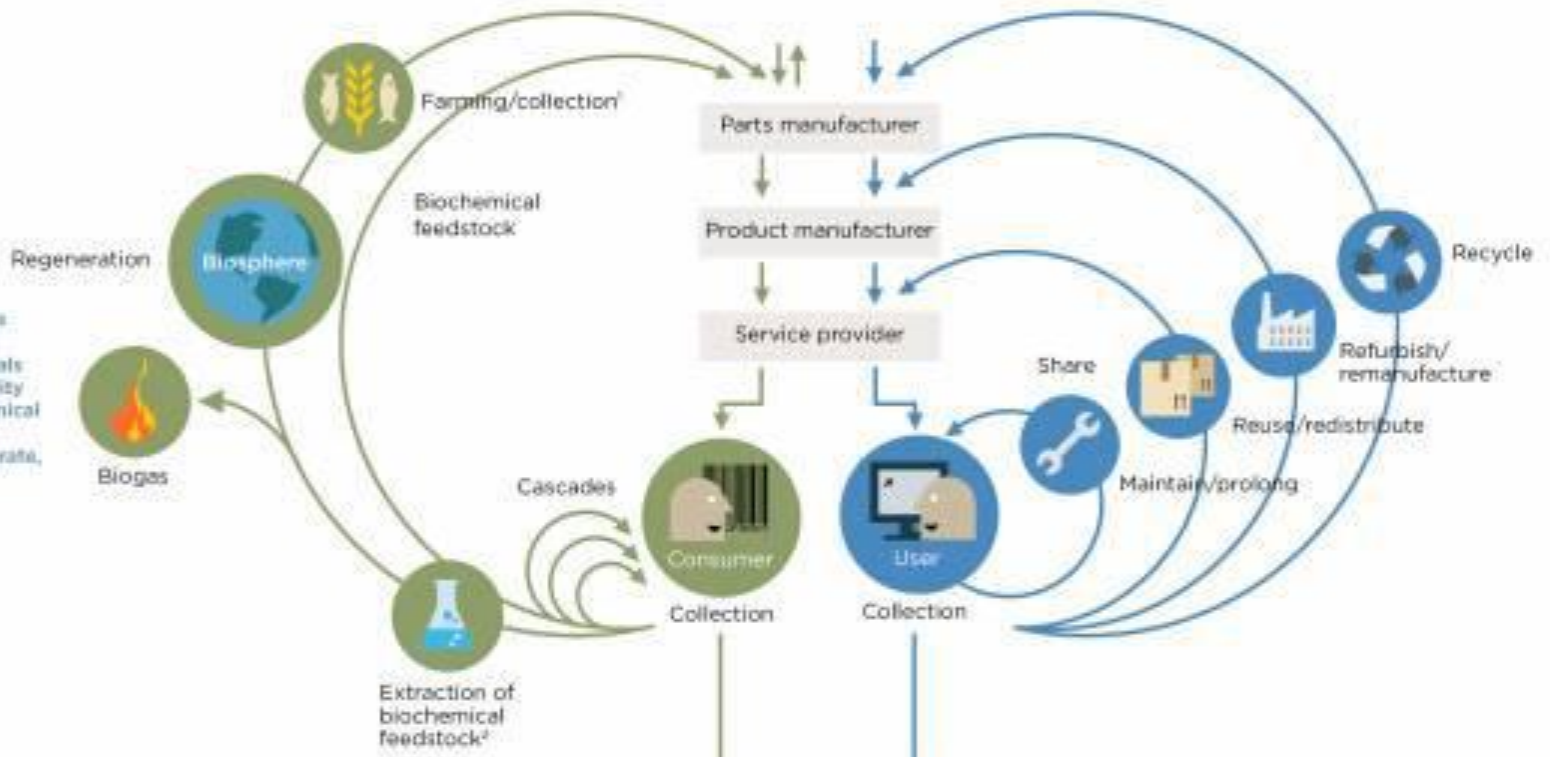
Renewables flow management

Stock management

PRINCIPLE

2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles  
 ReSOLVE levers: regenerate, share, optimise, loop



PRINCIPLE

3

Reduce system efficiency

# Circular Economy and Sustainability

By reviewing the literature, a team of researchers from Cambridge and TU Delft could show that there are at least eight different relationship types between sustainability and the circular economy:[1]

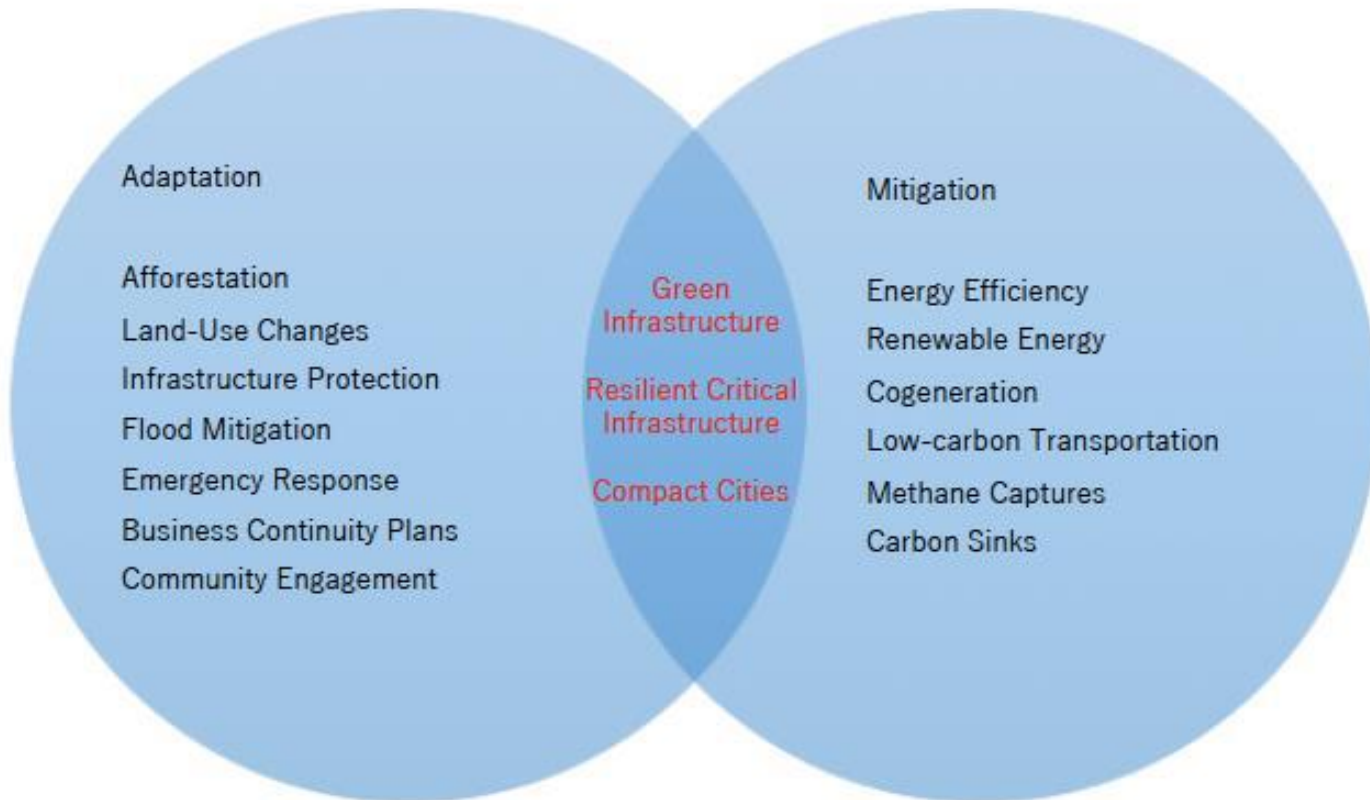
1. Conditional relation
2. Strong conditional relation
3. Necessary but not sufficient conditional relation
4. Beneficial relationship
5. Subset relation (structured and unstructured)
6. Degree relation
7. Cost-benefit/trade-off relation
8. Selective relation





# The Solutions: Smart, Green, Healthy Cities

## Adaptation + Mitigation Synergies

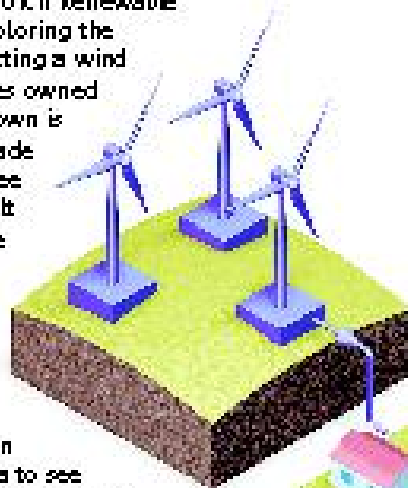


# The Green Industrial Revolution (2014): Smart Green Communities

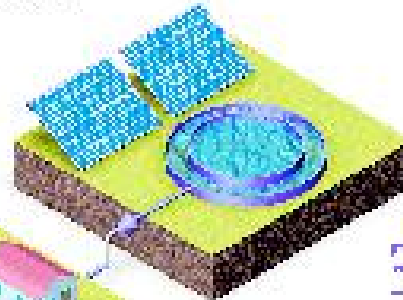
## Fowler's multipronged renewable plan

The town of Fowler wants to produce all its power from renewable energy sources and also use renewables to generate jobs.

**1** Housto n-based To ich Renewable Energy LLC is exploring the possibility of putting a wind farm on 500 acres owned by Fowler. The town is hoping to be is aside To ich to add three small 120-kilovolt turbines to serve the town.



**2** A newly developed process, being engineered for the town by Stewart Environmental Consultants LLC, cuts waste energy treatment costs by using microalgae to aerate water. It is scheduled to be built this year. The \$1 million system will be solar-powered. Studies are underway to add a photobiodigester that will turn the algae into a fuel, biochemical feedstock or fertilizer.



**4** Fowler has been developing data to see whether manure from m area feed lots could be used in an anaerobic digester to create methane. The methane would power a turbine and produce energy for the feed lot. Fowler hopes that some of the gas can be piped for use in town.

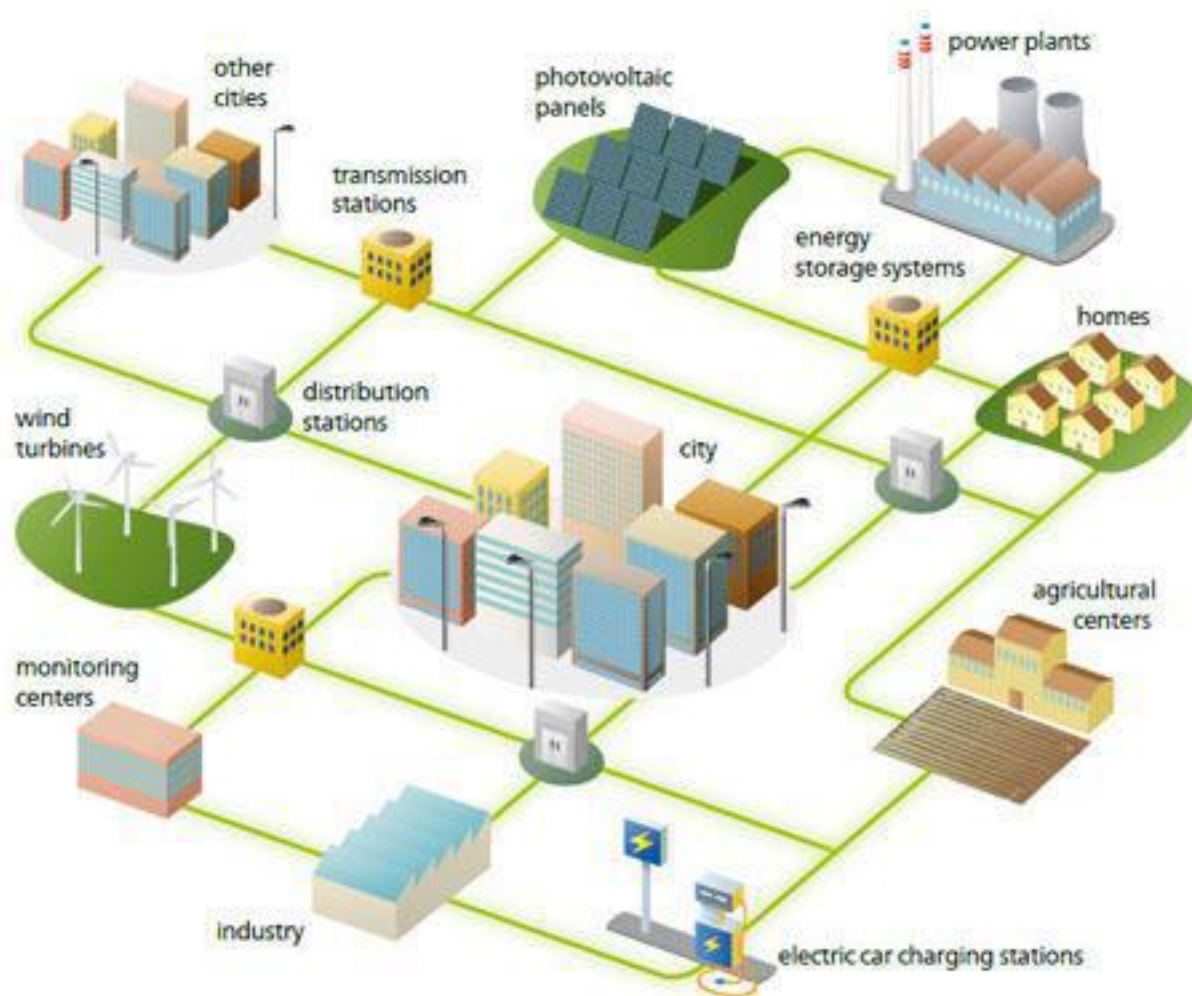


**3** Solar panels are being installed at eight municipal sites. The \$1.2 million in solar arrays are being installed by Denver-based Vibrant Solar Inc. The school board and Vibrant also are looking at the possibility of adding more solar panels to school buildings.



# Smart Green Grid Definition

Lixuan Hong, PhD (2010)





# Wall Street Journal

Energy Innovation and Technology

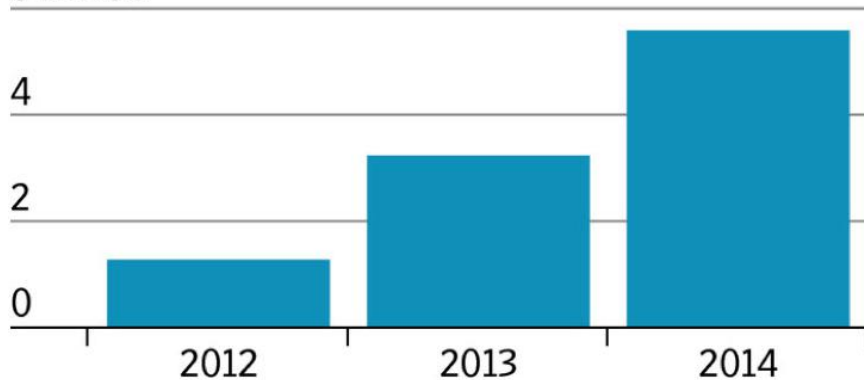
September 16, 2017



## A New Light

The number of LED streetlights installed in the U.S., out of about 45 million total. The Energy Department estimates an energy saving of 50% or more from outdoor LEDs.

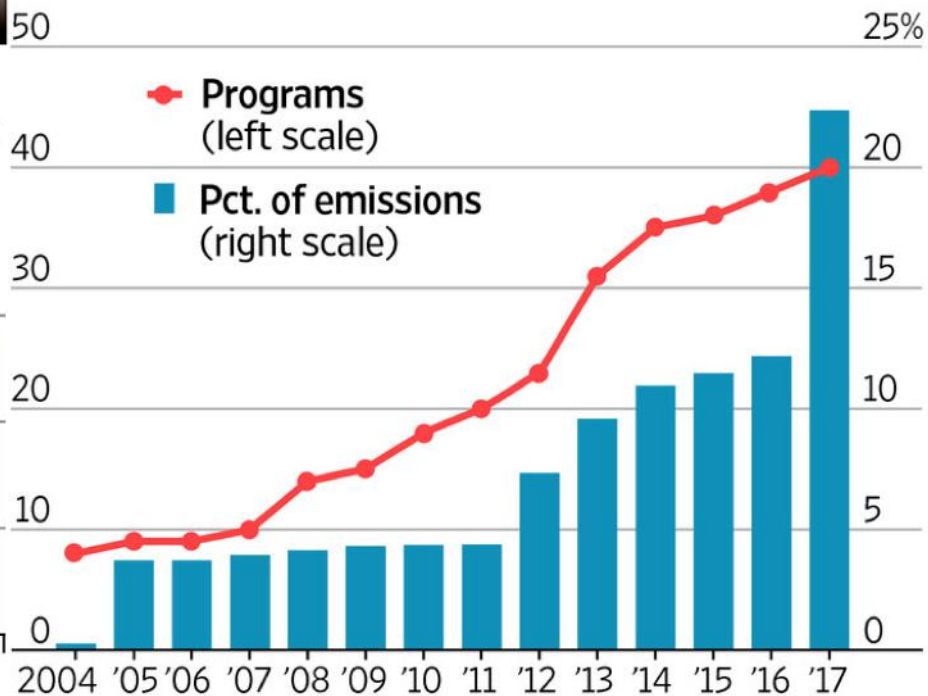
6 million



Source: Energy Department  
THE WALL STREET JOURNAL.

## Pricing Power

The number of regional, national and subnational carbon-pricing programs in place world-wide, and the percentage of global greenhouse-gas emissions covered. China's plan to implement a cap-and-trade system next year would raise the share of emissions subject to a pricing program to nearly a quarter of the global total.



Note: Figures are as of Dec. 31 of each year, and figures for 2016 and 2017 are projections. Emissions are given as a share of global greenhouse-gas emissions in 2012; annual changes in GHG emissions aren't shown.

Source: "Carbon Pricing Watch 2016," World Bank and Ecofys

THE WALL STREET JOURNAL.

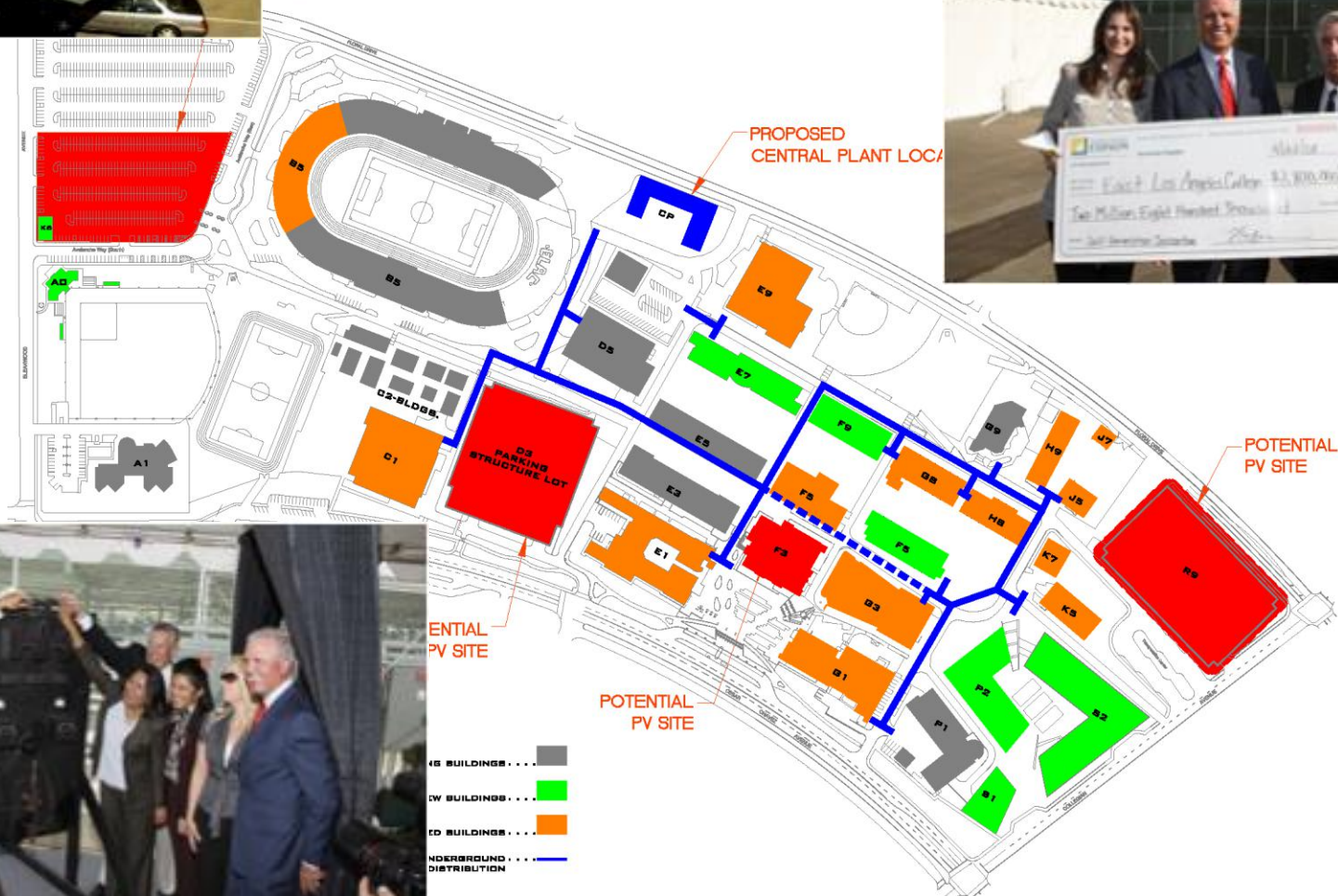
# East LA College Campus

## Central Plant and Solar/PV 1 MW (2006)

Location/Utility Routing



POTENTIAL PV SITE





# *Circular Economy and Sustainable Communities*

## Chapter #8: Google -- Recharging Car (1.6MW) Solar Campus

Goal: carbon neutral by December 2007 -- Done





# The Second Industrial Revolution

Thomas Edison (DC) vs Nikola Tesla (AC)

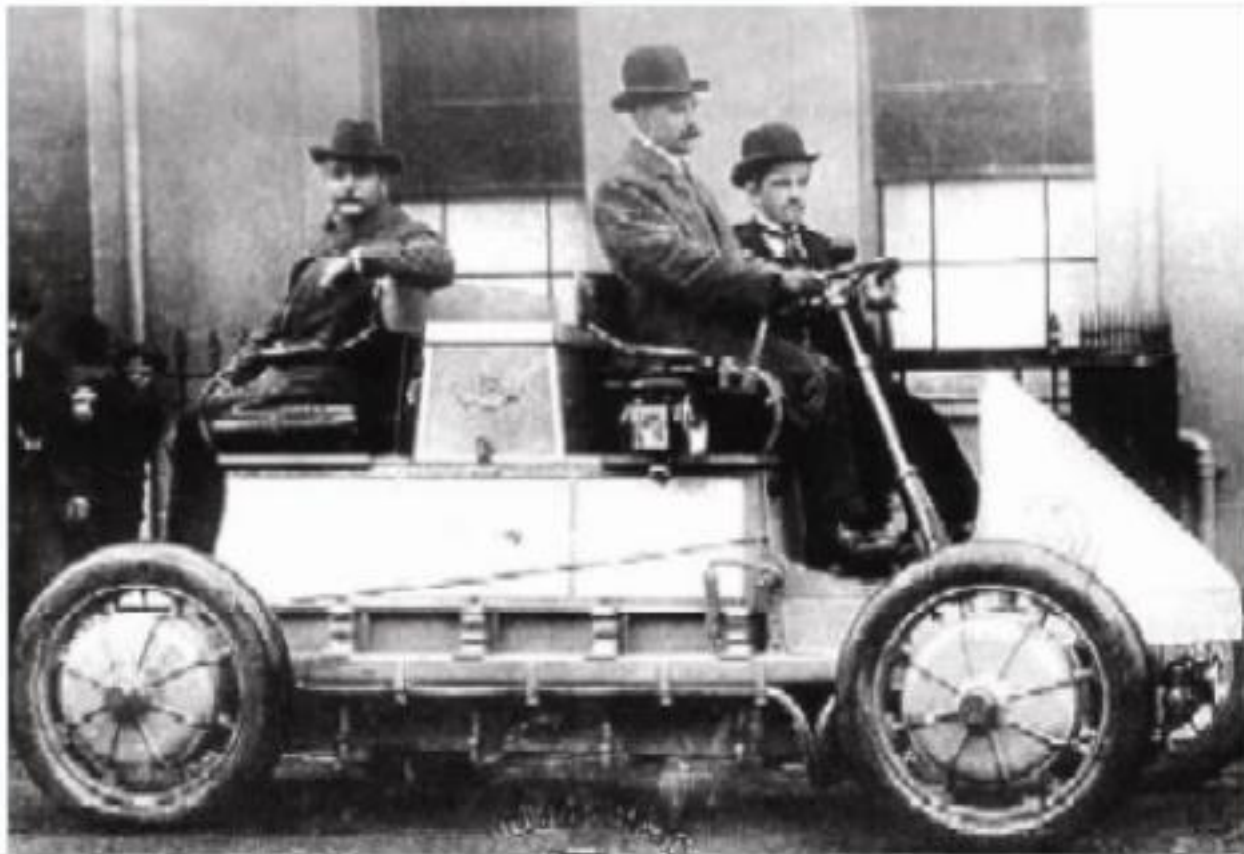


1893 Chicago World's Fair lit at night with the "Tesla AC System".



# The Original Hybrid Car

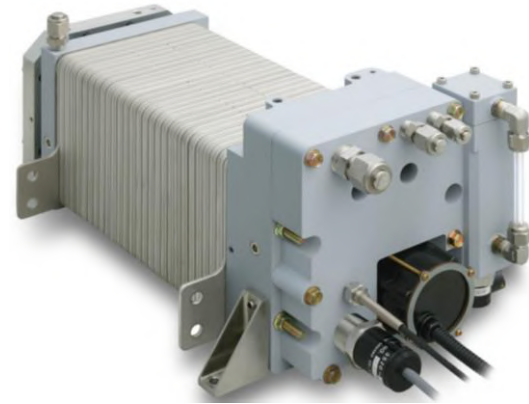
1903 Lohner-Porsche Carriage



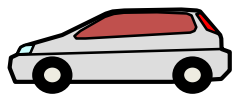
# Solar Hydrogen Station Technology



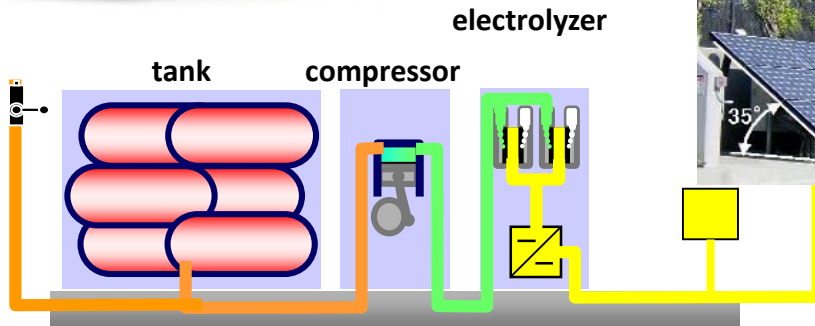
Unique Honda Designed  
**Electrolyzer** (PEM type)



**Renewable  
Electricity**      **Water**



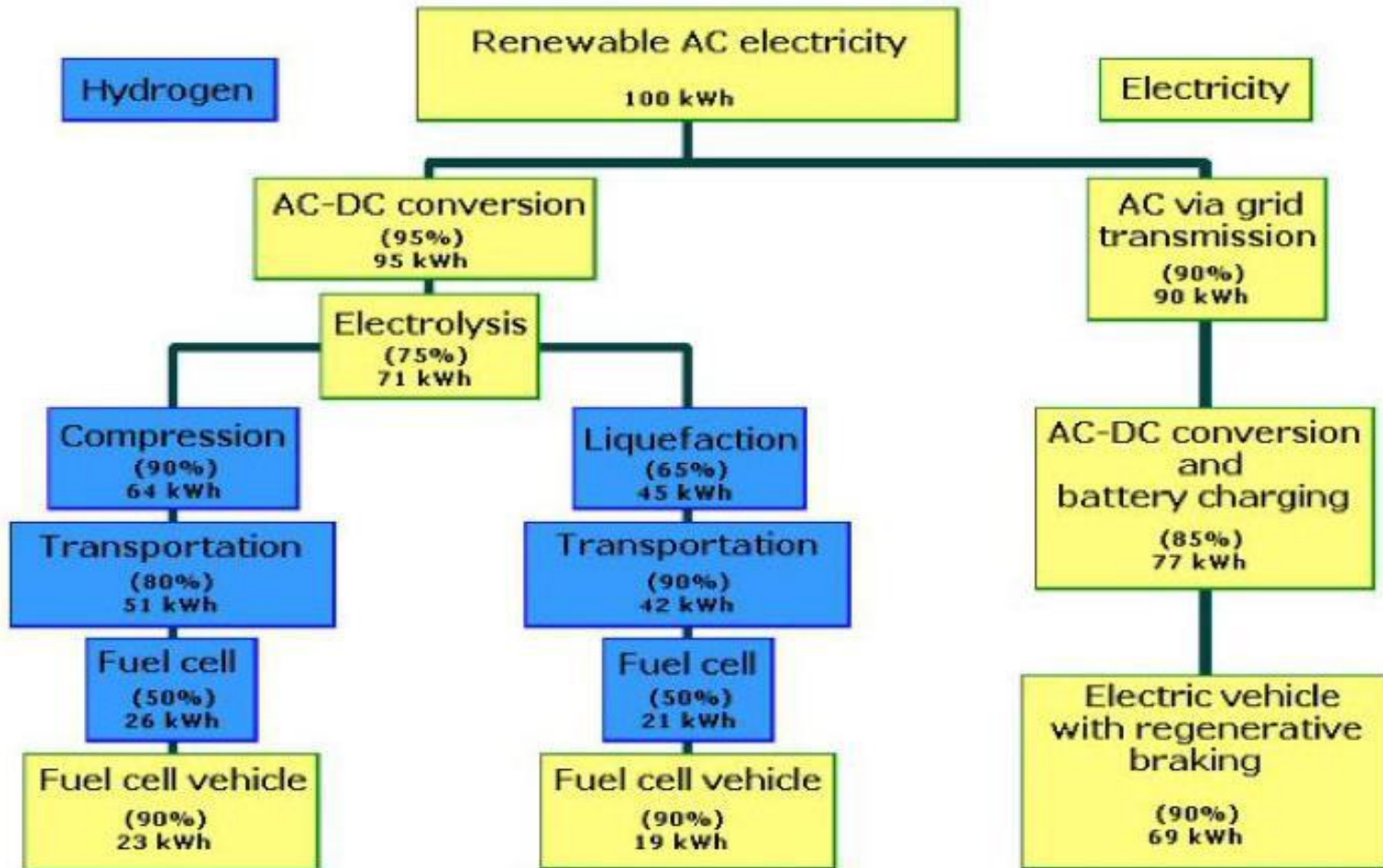
nozzle



Honda Produced  
**Solar Cells** (CIS type)



# Toyota Energy Options



$69 \text{ kWh} / 23 \text{ kWh} = 3$

Electric is 3x more efficient than Hydrogen!!!

# Electric Vehicle Sales Quintupled in Four Years



## GLOBAL EV SALES, BY REGION

2011 – 2014 (thousand units, % of total new sales)



Q1 – Q4 2014 (thousand units)



# Hanergy Solar Car Launch (July 2, 2016)





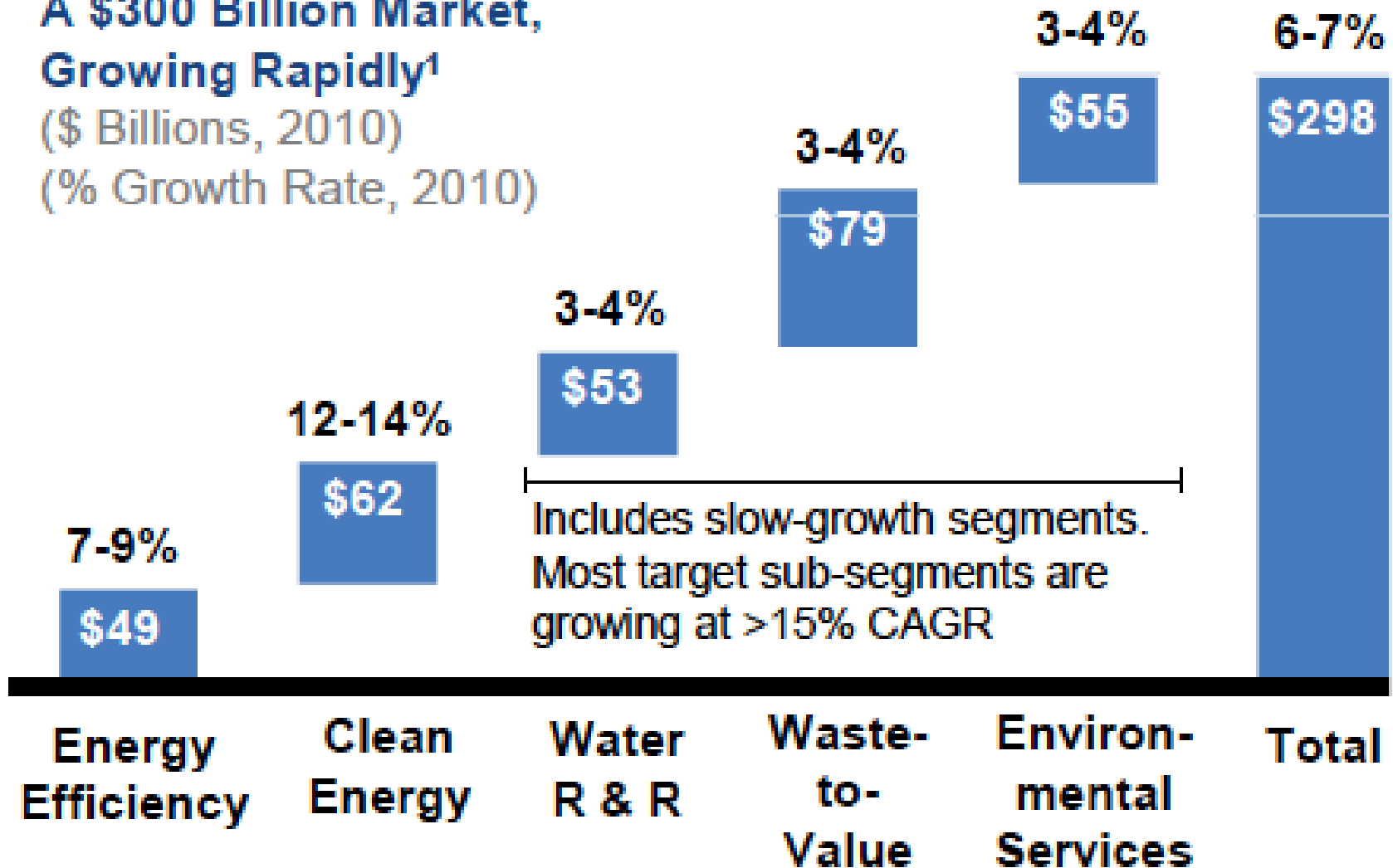
# The Green Industrial Revolution

## The Economics, Finance and Investments

**A \$300 Billion Market,  
Growing Rapidly<sup>1</sup>**

(\$ Billions, 2010)

(% Growth Rate, 2010)



# Wall Street Journal

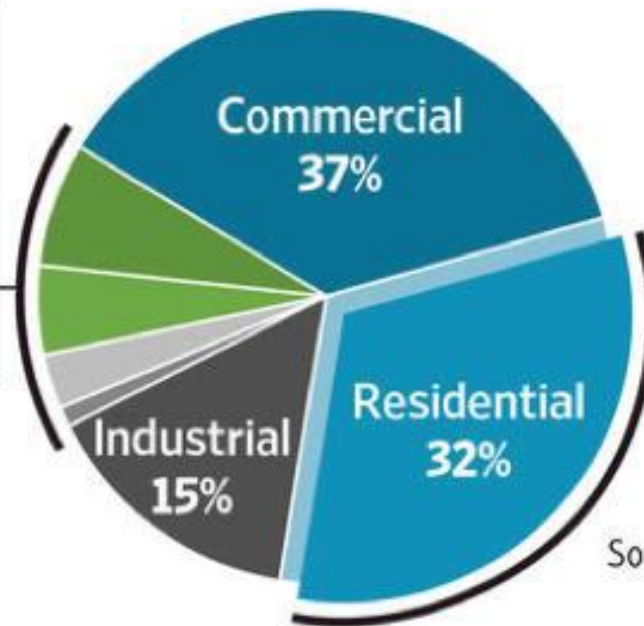
Energy Innovation and Technology

September 16, 2016

## Power Users

California electricity consumption by sector.  
Residential is the No. 2 user of power.

- Agriculture** | 7%
- Transport, communications, utilities** | 5%
- Mining** | 3%
- Street lighting** | 1%



Source: California Energy Commission, Integrated Energy Policy Report, 2008

## Where It Goes in the Home

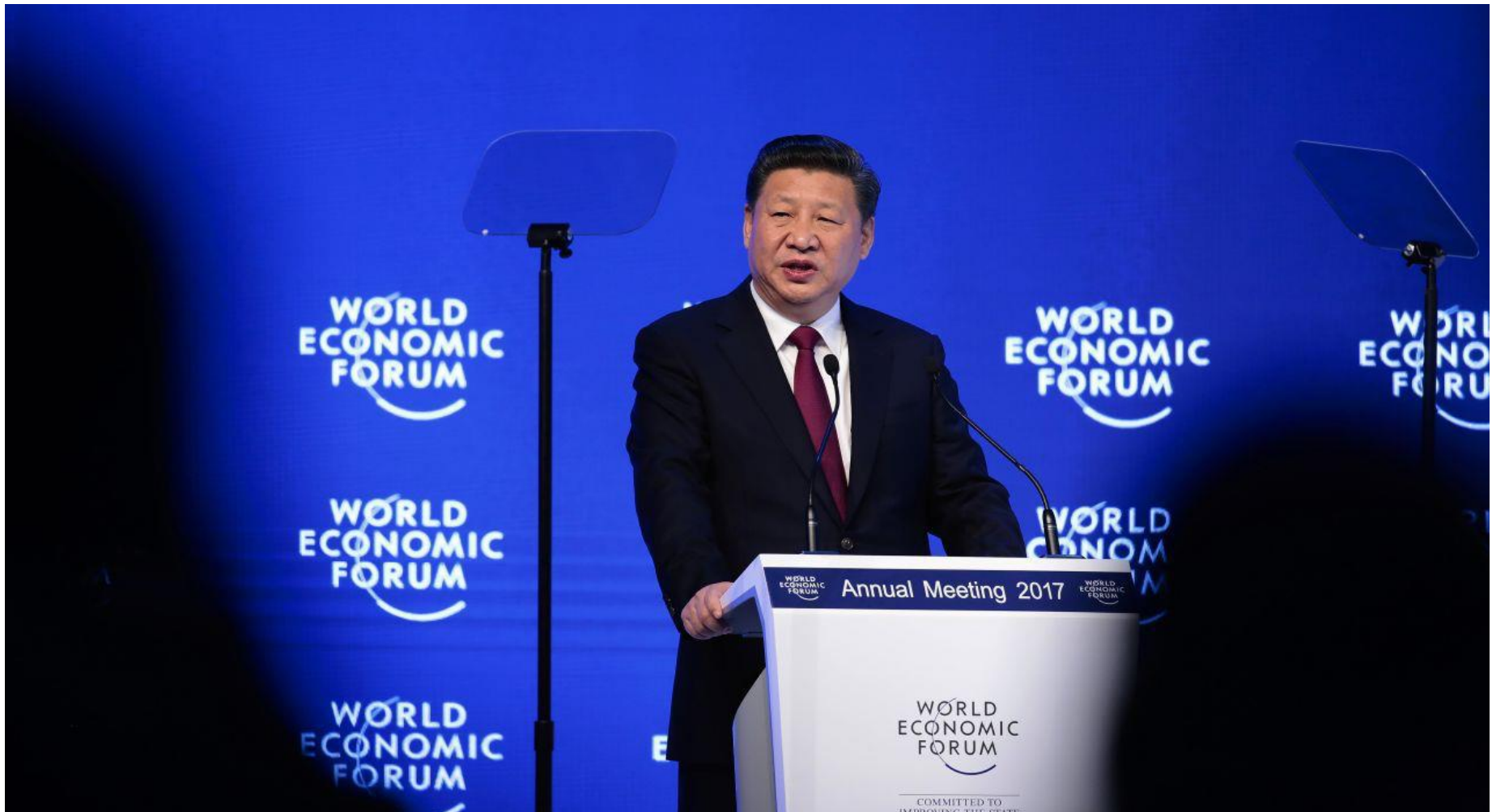
California residential energy consumption by end use

- Appliances, electronics, lighting** | 42%
- Space heating** | 27%
- Water heating** | 25%
- Air conditioning** | 4%

Source: EIA Residential Fact Sheet, 2009  
THE WALL STREET JOURNAL.

# Jinping Xi, China's president, speaks at opening plenary session of the World Economic Forum (WEF) about “Green Development”

Annual meeting in Davos, Switzerland, on Tuesday, Jan. 17, 2017. (Photo by Jason Alden/Bloomberg via Getty Images)





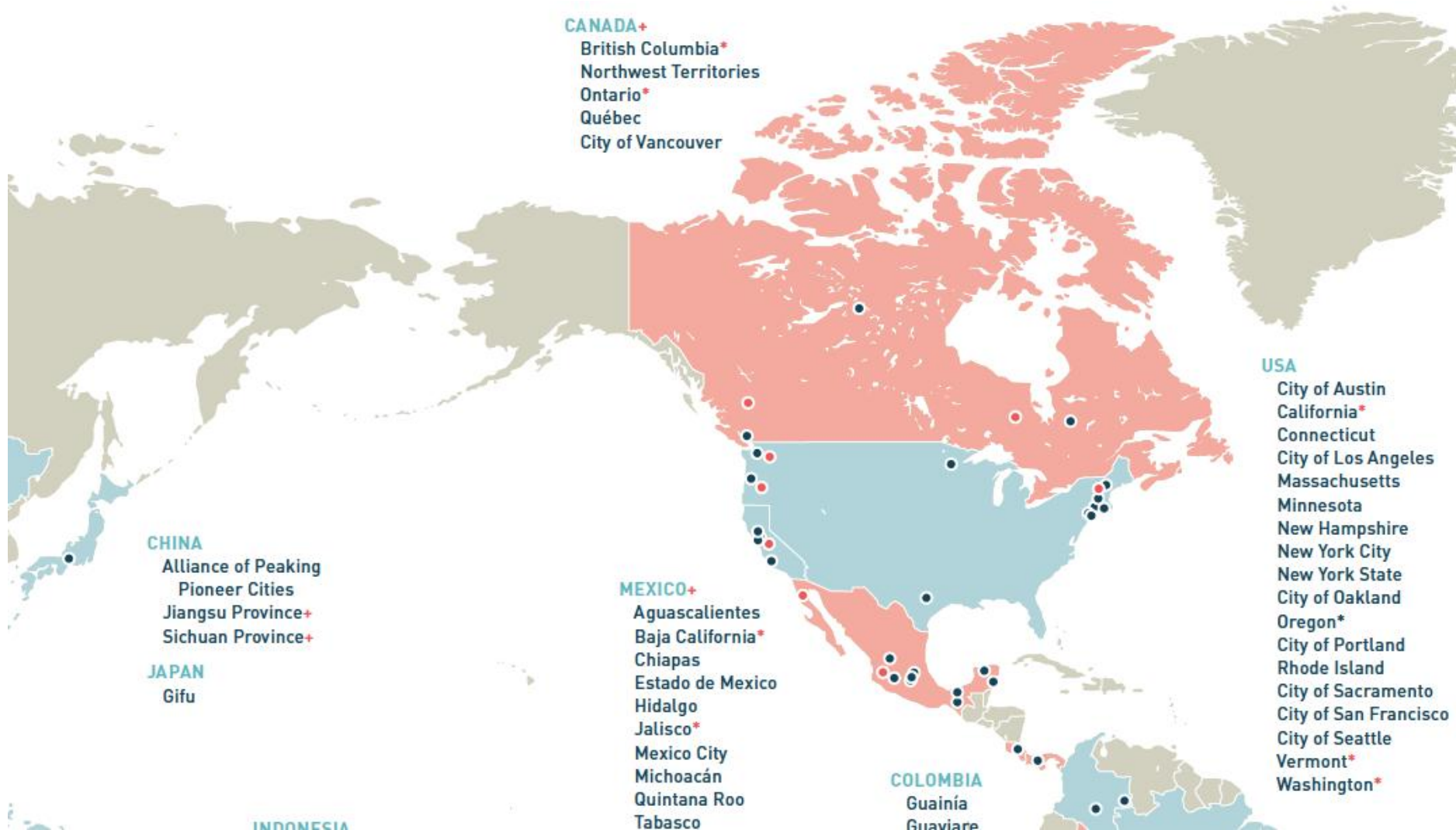
# Core Points in China's new #13 Five Year Plan (March 2016)

The green industrial revolution (development) is here now with technologies and economics:

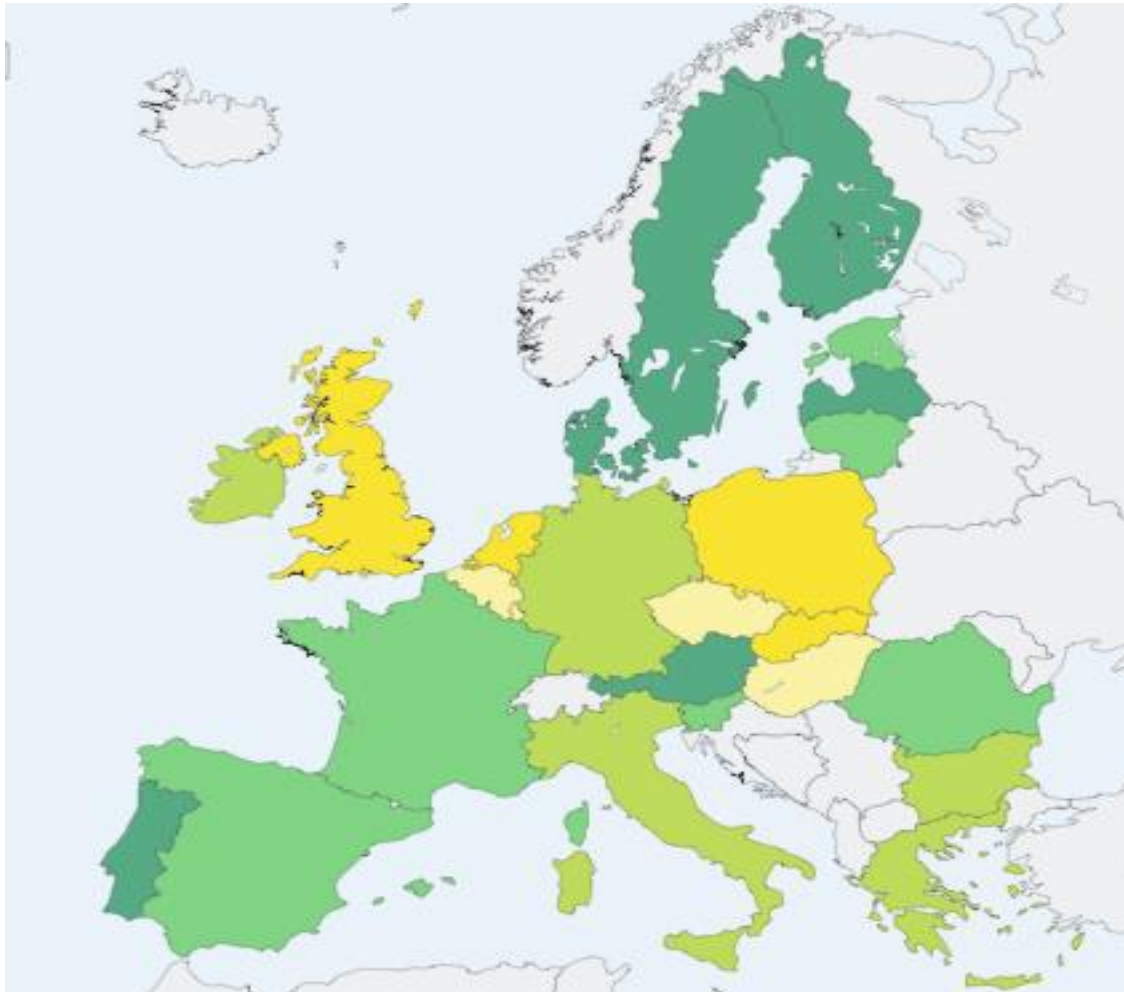
- “Deepen reform” with perspectives
- “Adopt to new norms”
- “Integrate” the wider view with the world
- Have the “world at home”
- “New starting point”
- “Upgrade its new normal”

# UN G19: Some of the Under2 Coalition

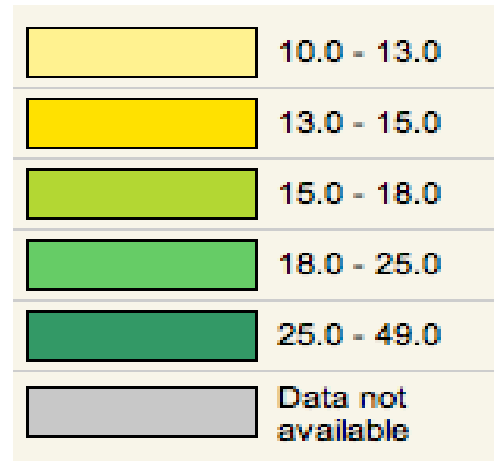
Members including the Nation-States like California



# EU Leads in Green Industrial Revolution

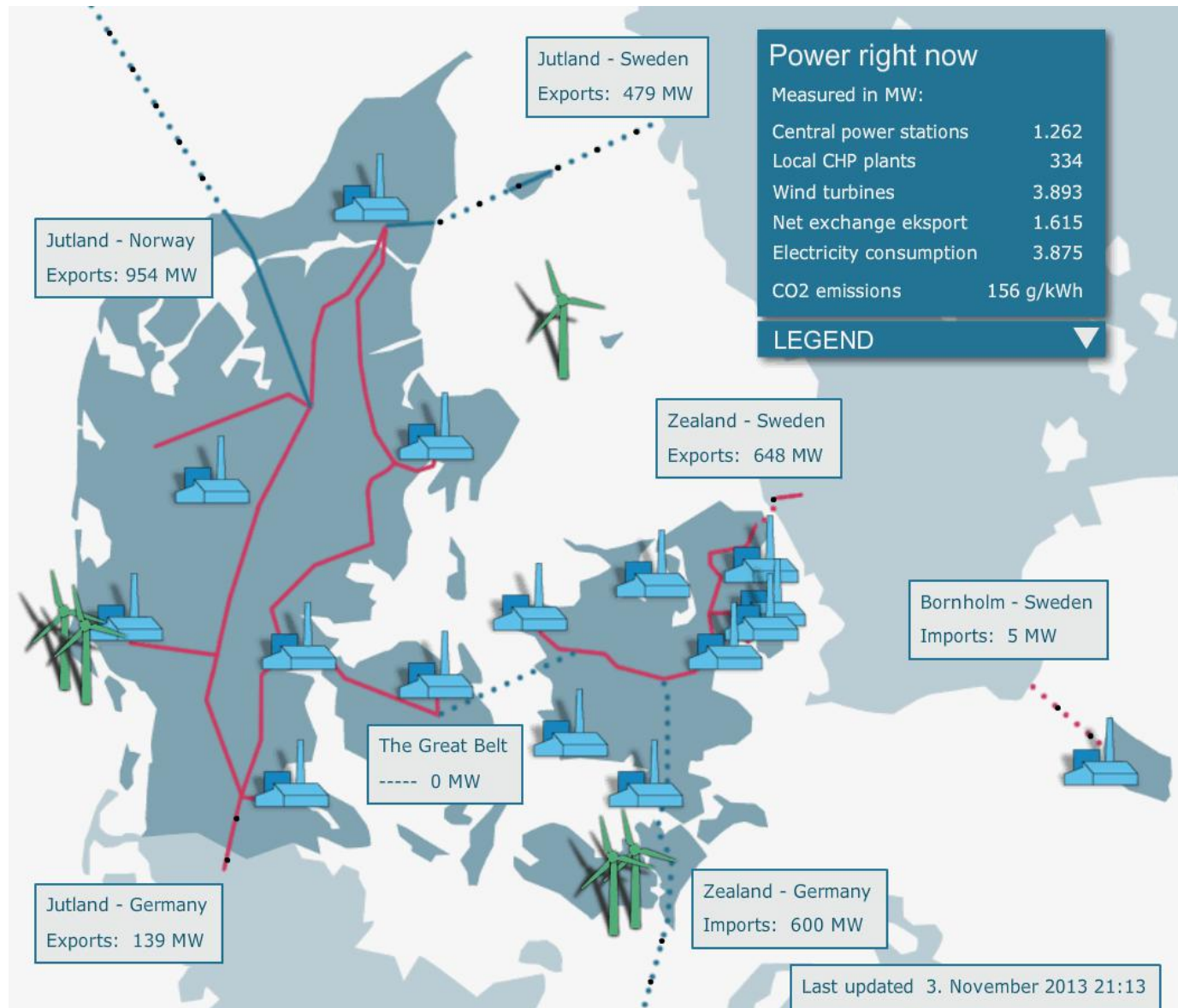


% of electricity  
by renewable  
generation

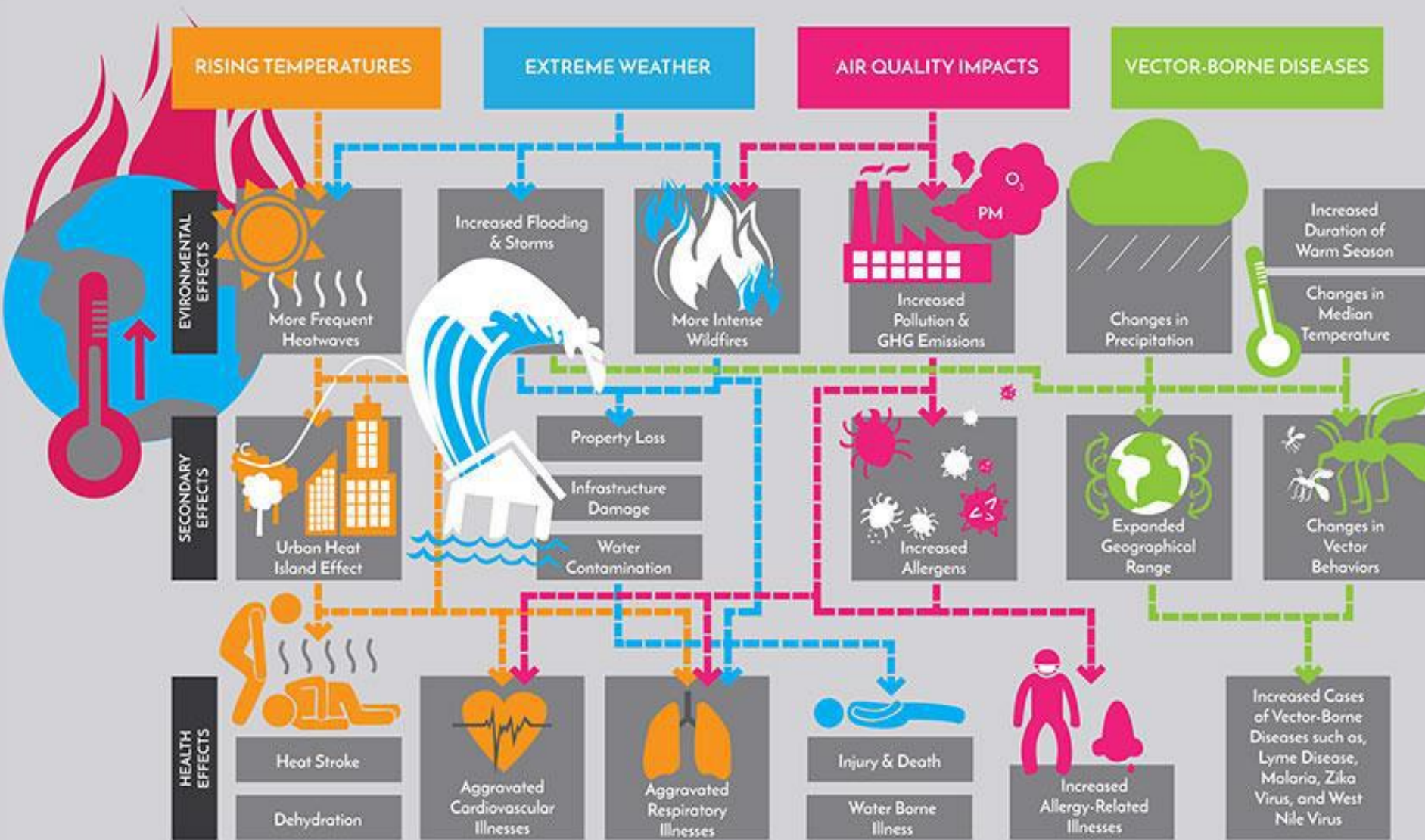




# Denmark 39% to renewable energy goals (2016: 50% by 2020 and 100% by 2050

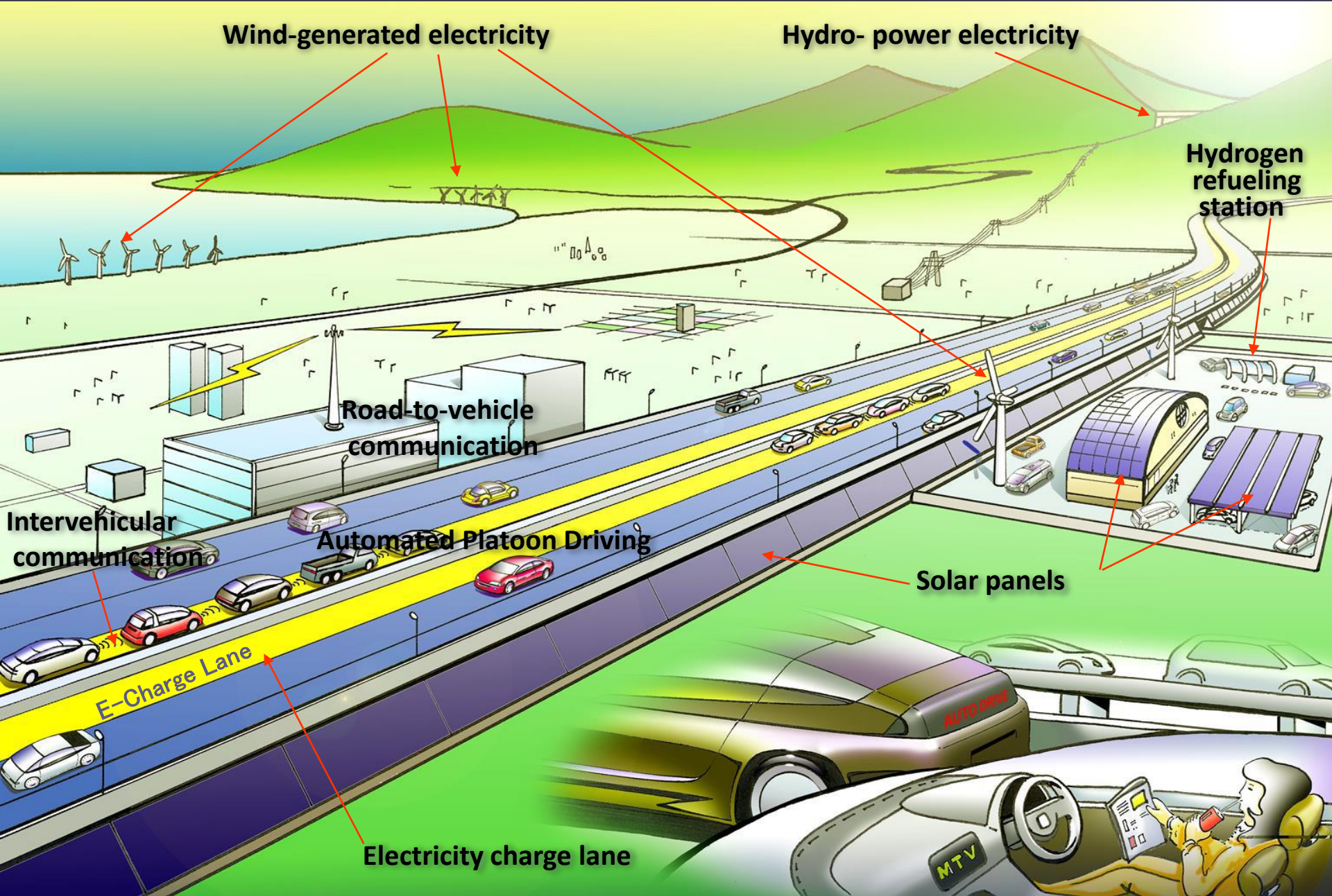


# HOW CLIMATE CHANGE AFFECTS YOUR HEALTH

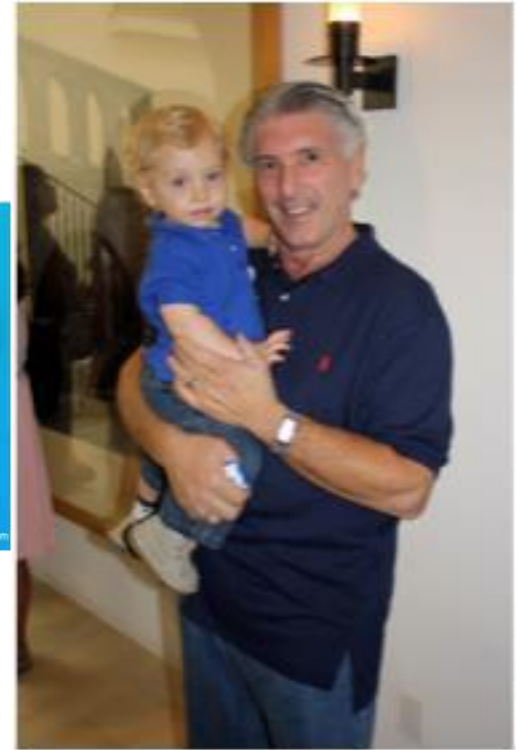




# A Vision of Future Sustainable Mobility







**Woodrow Clark II, MA<sup>3</sup>, Ph.D.**

**Qualitative Economist**

**Managing Director**

Clark Strategic Partners

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Beverly Hills, CA

USA 90209



**CM<sup>2</sup>C**

**Executive Producer**



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Web site: [www.clarkstrategicpartners.net](http://www.clarkstrategicpartners.net)

LinkedIn: <https://www.linkedin.com/in/woodrow-w-clark-ii-b6962214>



**08 novembre 2017**

**STATI GENERALI della GREEN ECONOMY**

**EUROPA, CINA E USA:  
IL FUTURO DELLA GREEN ECONOMY  
NEI NUOVI EQUILIBRI MONDIALI**

**ore 09.30 • 12.30**

**Promossi dal Consiglio Nazionale della Green Economy  
in collaborazione con**

